Thysanoptera of Africa - 1.

by

J. C. FAURE

Division of Entomology, Pretoria.

Suborder **TUBULIFERA**

Family PHLAEOTHRIPIDAE

Apterygothrips carolinae spec. nov. (Figs. 1—5, 8—9)

Female (apterous). Length (slightly to fully distended) 0.7—1.3 mm. *Colour* of head, thorax and abdomen uniformly brown to blackish brown; eyes so deep red as to appear black; *antennae*: segments i and v-viii rather uniformly dark grey, ii darker, dark brown at base and on both sides, becoming somewhat paler dorsally, with a small circular yellowish grey area around the dark grey areola, iii palest, greyish yellow, rarely pale grey, iv usually yellowish grey, somewhat variable, sometimes light grey but always paler than v-viii; mouth-cone nearly as dark as head, with black lines at edges of labrum, maxillae and labium, and a black spot at apex just basad of the labial palpi; palpi grey; *legs* about as dark as the body, except all tarsi and apices of fore- and hind tibiae which are greyish yellow, about as pale as third antenal segment; on the fore tibiae about one-third of their total length is pale, but on the hind tibiae the pale area occupies only about one-seventh, or less, and on both pairs the pale and dark areas merge imperceptibly into one another; sometimes the middle tibiae are also paler at apex, more or less like the hind tibiae; *major setae* of body and appendages transparent; internal coloration, which is usually prominent in head, thorax and abdomen, and often present in smaller areas of the femora and first antennal segments, bright red, rarely purplish red.

Sculpturing not prominent, but easily seen, especially with the aid of a phase-contrast microscope, in specimens treated with NaOH; integument minutely granular; *head* slightly roughened by irregular ridges between eyes and especially on the cephalic declivity, dorsally behind eyes with about 16 transverse, anastomosing and apparently slightly raised lines, which extend across dorsum and across cheeks about as far as a cephalo-caudal line through inner margins of eyes on ventral aspect, and therefore give the edges of the cheeks a minutely serrate appearance; occipital apodeme prominent, its convexity pointing cephalad, its greatest distance from hind margin of head about 17 μ, the area behind it smooth; median ventral area between eyes and as far caudad as mouth-cone practically smooth; mouth-cone not sculptured; antennae almost smooth; disc of *pronotum* feebly roughened, especially at sides, on posterior margin, behind pm setae, about four broken transverse lines; praepectal and probasisternal sclerites rather prominently lined; mesonotum with about four transverse anastomosing lines; praeepimeron and infraepisternum of mesothorax prominently lined, mesosternum practically smooth; metanotum very feintly lined on disc, but its postero-lateral border with irregular radiating lines, postepimeron plus episternum of metathorax with prominent lines, lateral extension of metasternum feebly reticulate, metasternum smooth; *legs:* all femora and coxae with fairly prominent transverse anastomosing lines, the tibiae with less distinct lines, tarsi smooth; pelta and tergite ii of *abdomen* feebly subreticulate, tergites iii-vii with much weaker lines, scarcely subreticulate, viii and ix about as clearly sculptured as ii, tube with about three scalloped transverse lines at base dorsally and about five ventrally; on tergites iii-viii antecostal lines distinct but very thin; sternite i with lines about as distinct as those on the pelta, sternites ii-vii practically smooth, viii feebly lined, ix distinctly sub-reticulate on each side, smooth in middle, antecostal lines on ii-viii very thin.

Head (fig. 1) large, cylindrical; its length measured on 76 ♀♀ varies from 112 to 155 μ and is about 1.0—1.2 times the greatest width across middle of cheeks; it is 1.4—1.5 as long as pronotum and 1.9—2.4 times as long as the tube; cheeks forming a continuous line with outer margins of eyes, very gently rounded. *Eyes* moderately large, not bulging, slightly produced caudad on inner margin ventrally, as shown on figure; ommatidia circular, separate from one another on inner margin of dorsal aspect, usually contiguous elsewhere, their diameter about 6—9 μ; dorsal eye length about 2—7 μ shorter than ventral length and 0.3 as long as the head, dorsal eye width about 3—5 μ greater than ventral width; in lateral aspect the caudal emargination is only about 9 μ deep; genal suture short, extending only about 15—21 μ cephalad from caudal margin; about 8—10 very minute setae on eyes between the ommatidia. *Ocelli* absent.

Head setae of dorsal aspect as illustrated (fig. 1); postoculars 17—21 μ long, expanded at apex, situated about 9 μ from eyes and 85 μ apart, other setae small, inconspicuous; ventral head setae very thin and finely pointed, the pair near antennae about 21 μ long, pair near inner caudal eye angles about 25 and the clypeal pair near mouth cone about 34 μ long, about five other pairs much shorter.

Mouth-cone broad and heavy, broadly rounded at apex, extending about 100 μ caudad from posterior dorsal margin of head; L./W. of palpi measured in μ on two females NaOH-treated, mounted ventral side uppermost: maxillary segment i: 4/6, ii: 21—23/6, terminal setae 15—21, labial 9/4, terminal setae 6—9; labrum blunt and rounded at apex extending about as far as caudal margin of labium; maxillary stylets in retracted position reaching to about the level of the postocular setae, forming a wide V, as illustrated (fig. 1), their sheaths jointed by a well- developed maxillary bridge that is about 59 μ wide (measured from one sheath to the other).

Antenna as illustrated (fig. 2); segment iv somewhat more variable in width than indicated under "measurements" below: in some cases it is 27 long by 25 μ wide, and even 25 long by 25 μ wide; sense cone formula: iii, 0—0; iv, 1—1; v, 1—1; vi, 1—1 (+1); vii, 1 dorsal; dimensions of sense cones, measured on two paratypes, L./W. in μ: iv, 12—14/3; v, 12—14/1—2; vi, 14—15/2; vii, 14/2; the antenna is 1.6—1.9 as long as the head.

Pronotum 0.7 as long as head and 0.5 as long as width of prothorax including coxae; margins not thickened, dorsal median apodeme not visible; epimeral sutures usually complete, rarely one of them does not attain hind margin of pronotum; of the major setae only ep. and pm. well developed (fig. 1), short, expanded at apex, all the others minute; rarely one of the pm. setae also much smaller than the other.

Praepectus present, but often less conspicuous than shown on figure 9, U, because it slopes upwards into a semi-dorso-ventral position; probasisternal plates large, subtriangular, somewhat variable in shape; prospinasternum small, triangular.

Mesonotum small, strongly transverse, that of holotype 21 μ long and 144 μ wide, its 2 pairs of setae on hind margin minute. Lateral aspect of mesothorax as illustrated (fig. 8). Of the three meso-episternal sclerites described by Doeksen (1941) and shown on his figures 87 and 88 for *Haplothrips leucanthemi* Schrank and *Hoplothrips pedicularius* Haliday respectively, only the first and third, for which the terms supraepisternum and infraepisternum are here adopted, (M, r on figs. 8, 10 and 13 of this paper) are present, so that the middle coxal cavity may be described as being "open" in front, in the sense that there is no sclerite, but only stipple-membrane, between the coxa and the ventral extremity of the mesothoracic spiracle. This same condition is also found in the type species of the genus, *Apterygothrips haloxyli* Priesner, of which Dr. Priesner kindly gave me a paratype some years ago, and *A. flavus* Faure. But in *Strassenia acarus* gen. et spec. nov., described below (fig. 10, T), the middle coxal cavity is "closed" by the second meso-episternal sclerite, for which the term medio-episternum is hereby proposed. Therefore in this species it is not possible to draw a line from the ventral extremity of the mesothoracic spiracle to the middle coxa without crossing over a sclerite. The same "closed" condition of the middle coxal cavity is also found in *Haplothrips leucanthemi* Schrank (see Doeksen's fig. 87).

Mesopraesternum degenerate, consisting of two widely separated triangular sclerites (fig. 9, n), these sclerites somewhat variable in size, sometimes much smaller than those illustrated. Mesosternum and its setae as illustrated (fig. 9); its posterior margin indicated by a prominent internal ridge associated with the furcae, but I see no suture on the surface.

Metanotum of holotype 64 μ long, including posterior border, and 144 μ wide, with two setae 6 μ long, 32 μ from anterior margin and 59 μ apart. Lateral sclerites of metathorax as shown on figure 8; the third metathoracic epimeral sclerite or postepimeron (fig. 8, I) is shown fused with the metathoracic episternum; there are several longitudinal lines on this elongate plate, but they look like internal ridges and there is no clear indication of a suture such as the one separating the plate from the lateral extension of the metathoracic sternum (fig. 8, O).

Legs short, without any noteworthy features, fore and hind femora not enlarged; fore tarsi without teeth; tibiae without any strong spur-like setae at their apices and without comb-like rows of setae.

Abdomen: pelta (fig. 3) (= median sclerite of tergite i) entire, broad, subrectangular, its lateral margins usually nearly straight, or diverging slightly caudad, but tending to be variable, sometimes convex at right and concave at left on one and the same specimen; its anterior margin slightly rounded; *sternite viii distinctly longer than its tergite,* projecting caudad about 34 μ beyond the hind margin of tergite, its caudal margin drawn out to a blunt point on middle line, as shown on figure 4; L. tergite/L. sternite on segments ii-viii of holotype, respectively, in μ: 49/45, 49/52, 49/49, 56/52, 56/56, 52/64 and 55/89. Tergite ix of holotype 51 μ long, 106 μ wide at base and 72 μ wide at apex. *Tube* as illustrated (fig. 4), only about 0.4—0.5 as long as the head and 1.3—1.4 as long as its own width at base. *Abdominal setae*: sigmoids absent; on tergites of holotype: one pair of major setae, expanded at apex, on ii-v, situated one on each side about 35 μ from posterior angle, length 21 μ, on vi and vii situated about 21 μ from the angle, 25—30 μ long; viii with two expanded pairs, of which one at hind angles, the inner 23, the outer 38 μ long; on ii the posterior angular setae too small to measure, or absent, on iii-vi pointed, increasing in length caudad, 4—15 μ long; on vii the pointed angular pair 47 μ long; these S.2 setae of segments iii-vii are situated in the caudo-lateral angles of the sternites, although they appear to be postero-angulars of tergites in dorsal aspect; on ix the inner pair, S.1 knobbed or blunt, S.2 and S.3 pointed; on *sternites* ii-viii the median pair of setae, near hind margin (measured on holotype) much longer than the

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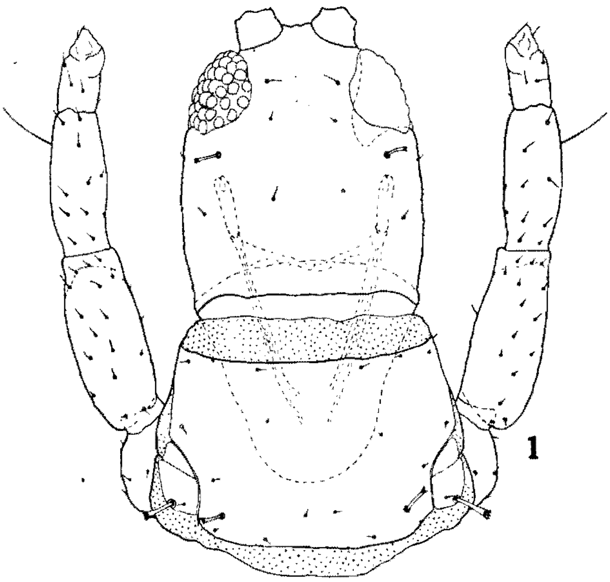
EXPLANATIONS OF FIGURES.

Apterygothrips carolinae spec. nov.

Fig. 1 — ♀, paratype, No. X. 1155-5, head and prothorax.
2 — ♀, paratype, No. X. 1155-7, right antenna.
3 — ♀, holotype, No. X. 1155-1, pelta.
4 — ♀, paratype, No. X. 1155-6, tip of abdomen.
5 — ♀, paratype, No. X. 1155-10, pseudovirga.

Strassenia acarus gen. et spec. nov.

Fig. 6 — ♂, apterous, paratype, No. X. 1243-4, right antenna.
7 — ♀, macropterous, paratype, No. X. 1243-8, right fore wing.
Figs. 1—4, 6, 7 Mrs. M. J. Meyer del.
5 R. zur Strassen del.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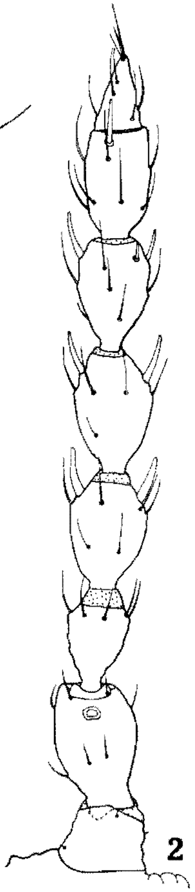
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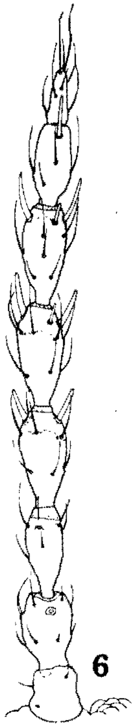
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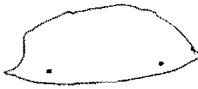
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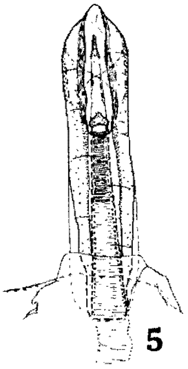
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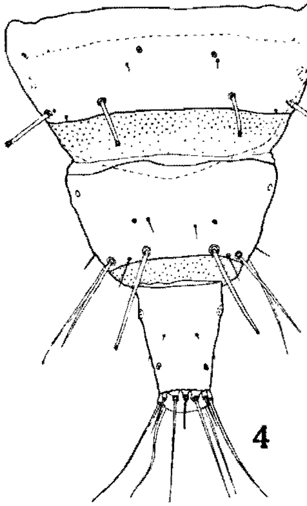
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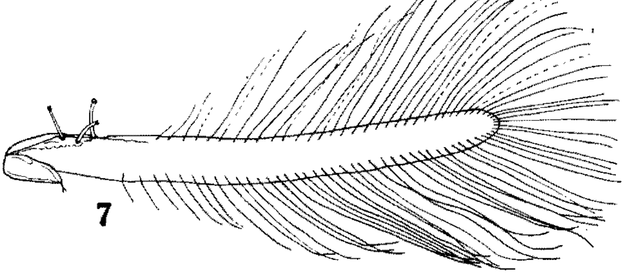
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outer pair, 30—38 μ on ii-v, their intervals 68—89 μ, on vi-viii 51—55 μ long with intervals respectively 93, 85 and 68 μ, the outer pair minute on ii-vi, only 4—9 μ long, on vii they are 13 μ long; there are only four setae near hind margin on ii-viii in addition to the S.2 setae in the latero-caudal angles, which are best seen in females mounted laterally; accessory disc setae very fine, only about 9 μ long, on ii only 2 or 3 setae, on iii-viii there are 6 to 10.

Dorsal pores on tergites, (their intervals measured on holotype): on pelta one pair of pores, interval 55 μ, no small setae, rarely only one pore present; on ii-vii one pair of pores, intervals 19—30 μ, two small setae close to pores, behind them or slightly latero-caudad of pores; viii with one pair of pores 32 μ apart, and one seta laterad of each pore; on ix usually one pair of pores 38 μ apart, and two setae between them, rarely one pore or no pores, or two pores without any setae; these dorsal pores and their small associated setae fairly constant in the series before me; rarely a pore or a seta missing, but no cases found of more than two small setae associated with the pores on any of the segments.

Measurements of *holotype* (apterous ♀ No. X.1155-1, NaOH-treated, of intermediate size on basis of head length) in μ, followed in parentheses by the ranges of this plus those of two paratype ♀ ♀, NaOH-treated (No. B. 61-1 the smallest ♀, and No. X.1155-3 one of the largest ♀ ♀): Length (distended) 1170(677—1260); *head* L.130(112—148), W. across eyes 114(103—), least W. at base 116(103—), greatest W. across cheeks 120(110—), W. on basal collar 116(103—120); eyes dorsal L. 42(—47), W. 30 and 32(27—), interval 51(47—), ventral L. 49(49), W. 25 and 27(—27), interval 59(59); *pronotum* L. 95(80—99), W. prothorax including coxae 190(162—193), setae; ep. 21(17—), pm. 17(4—19), pmm. 4(4); mesothorax W. 165(148—172), metathorax W. 165(141—169), its discal setae 6(—9); *legs* L./W. ff. 102(85—106)/32(—36), ft. 71(64—74)/27(27), fta. 42(31—)/19(—21), hf. 120(78—)/32(—42), ht. 102(81—109)/27(23—), hta. 45(38—52)/19(17—21); *abdomen* L. 769 (415 not fully distended —839), W. 215(205—222), pelta L. 38(27—42), W. 97(85—), tube (segment x only) L. 57(—61), W. at base 44(42—47), least W. at apex 25(23—27), setae on tergite ix: S.1, 47(42—51), S.2, 55(40—), S.3, 44(42—55), anal setae, long 59(44—68).

Antennae: total L. 233(212—243)

Segm.	L.	W.	Segm.	L.	W.
i . (whole)	25(21—),	25(23—);	v	30(—32) ,	23(21—);
ii	34(30—),	23(—25);	vi	30(—32) ,	21(19—);
iii	23(17—),	19(17—);	vii	30(27—34),	19(19) ;
iv	27(27) ,	23(21—);	viii	23(21—25),	13(13) .

Male (apterous) Length (distended) 0.8—1.0 mm. Smaller than female, but very similar to it in colour and structure. The relative lengths and widths of the head, prothorax and tube agree with those of the female.

Fore tarsus of the male usually unarmed, but rarely with a minute tooth. Abdominal tergites and sternites approximately equal in length; L.tergite/L.sternite on segments ii-viii of allotype, respectively, in μ: 44/42, 40/47, 42/47, 44/51, 47/51, 42/51 and 44/51. Tergite ix of allotype 44 μ long, 78 wide at base and 66 μ wide at apex.

Abdominal setae very similar in the two sexes, except that on ix the seta S.2 is much shorter and spine-like in the male, and the accessories at middle of sternites iv-viii are usually less numerous and more variable in number, often only 2—5 present.

Pores on tergites: on viii two pores 21—34 μ apart, but the small setae varying from none to one or two, usually situated slightly laterad of the pores; on ix two pores 30—38 μ apart, usually without any small setae, rarely with one seta in front of one of the pores; on vii often no pores, sometimes one or two, but two small setae generally present; on ii-vi two pores present in about half of the males, usually with two small setae behind them, on other males no pores, or one; pelta usually with two pores near hind margin, 44—64 μ apart, rarely with one seta between them. While the dorsal pores of the tergites and their small setae are rather constant in the females, there is much more variation in the males, but in this sex also no cases were found of more than two setae associated with the pores.

Genitalia. Pseudovirga as illustrated (fig. 5); measured on 18 ♂♂ the greatest width near apex was 8 μ on 11 ♂♂ and 9 μ on 7 ♂♂. There are 64 ♂♂ before me with the genitalia mounted under a separate cover glass; 57 of these have the pseudovirga very similar to the one figured. In seven males the pseudovirga is slightly notched on one or on both sides, but I regard this as an abnormality, possibly due to the process of preserving and mounting.

Measurements of *allotype* (apterous ♂ No. X.1155-2, one of the largest in the series, on the basis of head length) in μ, followed in parentheses by those of one of the smallest paratype ♂♂, No. X.1155-4, NaOH-treated: Length (distended) 985(831); *head* L. 134(113), W. across eyes 102(99), least W. at base 99(101), greatest W. across cheeks 109(110), W. on basal collar 102(101); eyes (those of a paratype ♂, NaOH-treated, with head L. 130 substituted for measurements of allotype): dorsal L. 44(38), W. 30(27 and 30), interval 44(42), ventral L. 44(42), W. 23 and 25(23), interval 55(55); *mouth-cone* L. from posterior dorsal margin of head 85(85); palpi and maxillary bridges measured on two ♂♂ paratypes, NaOH-treated, mounted ventral side uppermost: palpi L./W. maxillary segment i: 4(4)/6(6), ii: 19(19)/6(6), terminal setae (13)15, labial: 11(9)/4(4), terminal setae 6(6), W. maxillary bridge 57(59); *pronotum* L. 88(78), W. prothorax including coxae 169(162), setae: ep 19(17), pm. 13(13); mesothorax W. 155(148), mesonotum L. 32(21), W. 129(123), metathorax W. 144(141), metanotum L. 61(51), W. 129(123); *legs* L./W. ff. 85(85)/38(34), ft. 71(64)/25(25), fta. 38(38)/19(19), its tooth L. 2(0), hf. 106(99)/38(34), ht. 99(85)/23(25), hta. 42(42)/17(17); *abdomen* L. 615(508), W. 169(162), pelta L. 36(27), W. 76(68), tube (segment x only) 61(53), W. at base 40(40), least W. at apex 25(25), setae on tergite ix: S.1, 47 and 49(42), S.2, 21(17), S.3, 59 and 66(47 and 51); anal setae long 59(51); short 17(13).

Antennae: total L. 231(212)

Segm.	L.	W.	Segm.	L.	W.
i (whole)	21(19),	23(21);	v	32(30),	19(19);
ii	30(30),	21(21);	vi	32(27),	19(19);
iii	25(21),	19(19);	vii	32(30),	17(17);
iv	27(25),	21(21);	viii	21(19),	13(11).

Material studied: 126 ♀ ♀ and 81 ♂ ♂, all apterous, mounted on slides in Canada balsam, collected by the writer in the CAPE PROVINCE: Middelburg, 18-ii-1940, 27 ♀ ♀ and 7 ♂ ♂ (No. B.61) on *Aster filifolius* Vent.; Ceres, about 40 miles north-east of the town, near Inverdoorn Dam, 23-x-1957, 99 ♀ ♀ and 74 ♂ ♂ (No. X.1155) on *Pteronia pallens* Linn. f. According to the classification of veld types of Acocks (1953), Middelburg lies in the False Upper Karoo, and Inverdoorn Dam in the Succulent Karoo.

Key to the known species of Apterygothrips Priesner 1933.

1. Antennal segment iii without sense-cones; of the major prothoracic setae only ep. and pm. developed, about 13—19 μ long, all the others minute, 4 μ or less; fore tarsi without teeth, rarely with a minute tooth in the male; body colour brown . . . . *carolinae* spec. nov.

— Antennal iii with one sense-cone; on prothorax at least aa. and cx. also developed, about 20—34 μ long, in addition to ep. and pm. which are about 25—36 μ long; fore tarsi with a tooth at apex; body colour brown or yellow : 2

2. On prothorax aa., cx. and pm. setae capitate or expanded; head length about 200 μ; colour of body (except tube) yellow . . *flavus* Faure 1940.

— On prothorax aa., cx. and pm. setae pointed; head length about 135 μ; colour of body grey-brown . . . . *haloxyli* Priesner, 1933.

A. carolinae spec. nov. resembles the type species *haloxyli* Priesner and *flavus* Faure in general *habitus*, in the presence of the praepectus, in the structure of the mesopraesternum, in the absence of the medioepisternum of the mesothorax, the general shape and size of the pelta, and the close union of the antennal segments vii and viii. The fact that it differs from *haloxyli* and *flavus* in the absence of a prominent fore tarsal tooth might be regarded as grounds for placing it in another genus. My view is that the fore-tarsal tooth should not be given too much weight as a generic character; and in *carolinae* a minute tooth is sometimes present in the male. In the genus *Haplothrips* Serville 1843 we have many species with, as well as many species without, a fore tarsal tooth.

This new species is named after my assistant Miss J. C. F. Boshoff in recognition of her very good services as preparator and artist.

Agrothrips priesneri Jacot-Guillarmod

1939 *J. ent. Soc. S. Afr.* 2 pp. 40-43.
1946 *Apterygothrips luteus* Faure *J. ent. Soc. S. Afr.* 9 pp. 11-12. — New synonymy.

My friend Mr. C. F. Jacot-Guillarmod has kindly loaned me the types of *Agrothrips priesneri* for comparison with *luteus*, thereby enabling me to confirm the above synonymy.

STRASSENIA gen. nov.

Body small, more or less flattened; sclupturing moderately distinct, sternites v-viii at sides as heavily sculptured as their tergites; *head* about as wide as long, widest on line of postocular setae, distinctly narrower at base than at eyes, not raised on middorsal line, not produced in front of eyes except for interantennal projection; eyes forming a continuous line with cheeks, not produced dorsally or ventrally; ocelli on a slightly raised hump, the anterior ocellus not projecting in front of interantennal process; *antennae* eight segmented, slender, about 2.3 times as long as head, areola on ii at apex of segment, iii short and narrow, viii broadly joined to vii, not narrowed at base, sense-cones: iii, 0—0, iv, 1—2; none of the segments produced ventrally, nor with differentiated areas; *mouth-cone* short, extending about two-thirds across prosternum, rounded at apex, maxillary bristles when retracted extending to hind margins of eyes, almost parallel in posterior half of head, joined by a wide maxillary bridge, their interval at bridge roughly one-third of head width at this level; epimeral sutures well developed; postoculars and all the usual pronotal setae well developed, expanded at apex; praepectus present, two large subtriangular probasisternal sclerites, prospinasternum very small; medioepisternum of *mesothorax* present, therefore middle coxal cavities "closed" in front; fore wings not narrowed at middle, duplicated cilia absent; legs without noteworthy features, fore femora, tibiae and tarsi unarmed; *pelta* moderately large, subrectangular, entire, sternites iii-vii produced cephalad, longer than their tergites, sternite viii in female longer than its tergite, but produced caudad; tube only 0.5 as long as head, its sides parallel at base, thence converging, feintly concave at about the middle; in life the abdomen is curved upward, and forward, its tip almost touching the head, so that the insect looks like a mite.

Typus generis: Strassenia acarus spec. nov.

This new genus runs to near *Lissothrips* Hood 1908 in Priesner's key to the genera of the Phlaeothripidae (1949); these two genera agree in having a maxillary bridge, praepectus, entire pelta, and a small third antennal segment, but the new genus differs in (1) eighth antennal segment not narrowed at base, (2) mesopraesternum entire, not degenerate, and (3) sternites iii-vii produced cephalad, longer than their tergites.

The new genus resembles *Bagnalliella* Karny 1920 in having ridges behind the eyes and the tube only about half as long as the head, but differs from it in having (1) sternites iii-vii produced cephalad, and (2) the mesopraesternum entire.

The important characters of *Strassenia* gen. nov. are: (1) sternites iii-vii produced cephalad, (2) sternites v-viii as heavily sculptured at sides as their tergites, (3) reticles on abdomen with striae more or less as in *Phibalothrips peringueyi* (Faure) 1925, (4) tube only about 0.5 as long as head, (5) eighth antennal segment broadly joined to seventh and (6) abdomen curved upwards and forwards over thorax in life.

I take pleasure in naming this interesting new genus for my colleague Dr. R. zur Strassen, in appreciation of the very high standard of his contributions to the taxonomy of the Thysanoptera and his great enthusiasm.

Strassenia acarus spec. nov. (Figs. 6, 7, 10-12, 14-16 and 24)

Female (macropterous, brachypterous and apterous). The only differences between the three forms lie in the wings, wingpads, the size of the pterothorax and the wing-retaining setae of the abdomen, therefore there is no need to give a separate description for each form. *Length* 1.2—1.5 mm. (distended). Colour: general colour of head, thorax and base of abdomen yellowish brown to reddish brown, middle of abdomen blackish brown, tip of abdomen brown, antennae and legs paler than body, wings grey; *head* brownish yellow, with a reddish tinge due to the orange red internal pigmentation, eyes so deep red as to appear black, ocellar crescents orange; *antennae*: i, ii and iii greyish yellow, iv, v and vi slightly darker, yellowish grey, vii and viii grey, viii somewhat darker than vii; mouth-cone yellowish grey, edges of maxillae and nearly whole of labium brown, apical half of labrum brown, its tip black, palpi grey; *pronotum* and pterothorax, dorsally and laterally, pale brown to brown, with prominent red internal pigmentation, ventral sclerites generally slightly paler brown; *wings* of macropterous female light grey, about as dark as antennal segments iv-vi, fore wing uniformly light grey except scale and area in front of it which are a shade darker, and some small darker spots scattered over wing surface; hind wing with a darker stripe which runs along the middle in about basal two-thirds and then gradually approaches hind margin in apical third; wing-pads of brachypterous female light brown in about basal three-fourths, transparent in apical one-fourth; *legs*: all coxae light brown, all trochanters and all tarsi (except their brown cups) greyish yellow, all femora and tibiae brownish yellow, with the brown shading darkest in basal half and on outside of all femora, while the fore tibiae are palest, sometimes almost wholly yellow, and the hind tibiae are usually the darkest among the tibiae; *abdomen*: tergites and sternites i-iii and ix about as pale brown as thorax, vi and viii a shade darker, v-vii dark brown to blackish brown, tube about as dark as viii, with a short paler transverse band at extreme base; internal red pigmentation abundant in abdomen, giving a reddish brown tinge to its paler segments; *major setae* of body and appendages, and wing fringes transparent, but wing-retaining sigmoids and some of the major setae on the darkest abdominal segments grey to pale brown.

Sculpturing fairly prominent on specimens macerated in NaOH. Integument minutely granular. *Head* slightly roughened in ocellar area, dorsal surface from about middle of eyes to occipital apodeme irregularly but distinctly reticulate and also slightly rough, the reticles becoming transversely elongate on cheeks, extending across lateral aspect and on to ventral aspect, but only about as far as one-third of eye width from outer margin on each side; occiput behind occipital apodeme smooth; median ventral area of head smooth; antennae with feeble transverse lines on i-vii, not shown on drawing; mouth-cone smooth; *pronotum* roughened with irregular ridges in about one-fourth of width on each side and on epimera, and with two or three prominent transverse, broken ridges just in front of pm. setae, median part of disc also slightly roughened, and feebly subreticulate, the area behind the pm. setae with about six distinct transverse anastomosing lines, prosternal sclerites with transverse lines; *mesonotum* reticulate, the cells mainly transversely elongate, and with a prominent transverse apodeme on hind margin; of the lateral sclerites of the mesothorax, the praeepimeron and infraepisternum (L and r on fig. 10) with prominent vertical lines, the supraepisternum, infrapostepimeron, and medioepisternum (M, N and T on fig. 10) feebly subreticulate; mesopraesternum with feeble transverse lines, mesosternum smooth.

Disc of *metanotum* with a prominent transverse apodeme close to anterior margin, surface more feebly reticulate than mesonotum and the cells mainly subhexagonal; in the macropterous female a median triangular scutellum weakly differentiated, its lateral margins marked by two or three heavier lines on each side; postero-lateral flange of metanotum with feeble lines; laterally, the lateral extension of metasternum (O on fig. 10) with prominent, mainly vertical anastomosing lines, postepimeron plus episternum (I on fig. 10) with two thick apodemes and about three lines running in the direction of its long axis; median disc of metasternum smooth, but just caudad of middle coxae there are five or six prominent lines which diverge dorsad; *wings*: surface of membrane of both pairs with very thin transverse lines and mainly elongate colour spots that seem to be slightly raised; legs: all coxae with a few feeble transverse lines; all femora and tibiae with prominent, transverse anastomosing lines throughout their length, there being about 30 lines on a hind femur, tarsi smooth.

Sculpture of abdomen: all tergites and sternites, as well as pelta and tube, subreticulate to reticulate, this sculpture about as distinct on most segments as on mesonotum; on the whole disc of tergites iii-v, and on most of the disc on tergites vi-viii, except about one-eighth of width along median longitudinal line, as well as on lateral third on each side of sternites v-viii, there are numerous fine longitudinal, straight striae (fig. 24) in the reticles, similar to those described and figured by the writer (1925) in *Phibalothrips peringueyi* (Faure); these striae differ from the wrinkles seen in the reticles on the abdomen in various species of *Caliothrips* Daniel 1904 in that they are straight and longer, often extending right across the reticles. I have not seen this type of striate sculpture in a member of the suborder Tubulifera before.

Especially in about one-third of their width on each side, the sculpturing on sternites v-viii is as prominent as it is on their tergites; this is probably due to the fact that the abdomen is curved up over the thorax, when the insect walks over a leaf, so that the sternites are exposed to the direct sunlight.

Head large, cylindrical, not raised on median dorsal line, its length 0.9—1.1 times the greatest width, which is just behind eyes, on line of postocular setae, 1.5—1.6 as long as pronotum, and 1.9—2.2 as long as the tube; cheeks rounded, converging to basal collar, greatest width of head 1.2 the least width near base; *eyes* scarcely bulging, their outer margin forming a continuous line with the cheeks, facets circular, contiguous, of approximately uniform size, dorsal eye length about 4—13 μ greater than ventral eye length, eyes not prominently produced caudad on dorsal or ventral aspect; *ocelli* present on macropterous females only, situated on a slightly raised hump, the anterior ocellus directed forward, the posterior pair dorso-laterad, contiguous with eyes, their posterior edges situated on a transverse line passing through middle of eyes; postocellar setae only about 6 μ long and situated 2—4 μ from posterior ocelli, ante- and inter-ocellars absent. Genal suture absent.

Head setae: postoculars large, expanded at apex, about 49—57 μ long, their interval 123—127 μ, situated only about 6—11 μ from eyes; one or two pairs of very fine, minute setae (about 6—8 μ long) on cheeks, a similar pair between the postoculars, and one or two pairs behind them; ventrally: four very short fine setae near antennae, a pair of very thin ones at inner posterior eye angles about 42 μ long, the large clypeal pair about 25 μ from mouth-cone, 25 μ apart and about 38 μ long, two shorter pairs caudad of these, and five to seven additional pairs of short fine setae scattered on area between eyes and large clypeal setae.

Mouth-cone short, extending about two-thirds across prosternum, labium rounded at apex, labrum pointed but not extending beyond edge of labium; L./W. of palpi of holotype in μ: maxillary segment i: 4/6, segment ii: 34/6, labial 11/4; maxillary bridge situated about midway between postocular setae and hind margin of head, its width measured from left to right maxillary sheath about 51—55 μ, its median length about 4 μ, its length at sides about 9 μ.

Antenna as illustrated (fig. 6); sense-cone formula: iii, 0—0; iv, 1—2; v, 1—1 (+1); vi, 1—1 (+1); vii, 1 dorsal; the cones short and slender, longest on iv of holotype 21 μ long by 2 μ wide.

Pronotum (fig. 14) 0.6—0.7 as long as the head, and 0.4—0.5 as long as width of prothorax including coxae; margins not thickened, median dorsal apodeme scarcely visible; major setae all well developed, expanded at apex, ep. longest, pmm. very small, pointed, only about 4 μ long, ml. situated only about 17 μ from aa. and about 42 μ from ep.; sclerites of prosternum as illustrated, (fig. 11). *Mesonotum* strongly transverse; large expanded setae at extremities, 21 μ long, present only on macropterous females; two or three pairs near hind margin shorter, pointed. Lateral sclerites of mesothorax as illustrated (fig. 10); medioepisternum (figs. 10 and 11, T) usually connected with the mesosternum by a narrow band, only 4 μ long (measured in cephalo-caudal direction) at its shortest point, in apterous females and males, but rarely the band is interrupted, leaving the two sclerites unjoined; in the macropterous female the medioepisternum is about 17 μ long where it adjoins the mesosternum, and it is separated from the latter by a suture. Ventral sclerites of mesothorax and their setae as illustrated (fig. 11).

Metanotum of the two macropterous females 135—141 μ long, including posterior flange, as against 78 and 99 μ in the smallest and largest apterous females and 101 μ in a brachypterous female; it bears three small setae close together on each side on anterior margin, and one pair of pointed setae on the disc about 17 μ long, 51—72 μ apart, and about 40—50 μ from anterior margin; lateral sclerites of metathorax as illustrated (fig. 10); the postepimeron and episternum (I) are shown as one plate, since there is no suture separating them, but there is a well developed dark apodeme in the anterior part, which probably indicates the boundary between the two sclerites.

Fore wing of macropterous female as illustrated (fig. 7); measurements in μ: L. 600, W. across scale 64, greatest W. at first cilia 68, W. at middle 53, W. about 64 μ from apex 55, fringe L. anterior 219, posterior 247, subbasal setae, all expanded, a. 38, b. 32, c. 42, intervals a.-b. 13, b.-c. 13; duplicated cilia absent. On the brachypterous females the wing-pads are only about 25 μ long and 25 μ wide, or still smaller. *Legs* slender without any teeth, spurs or thick setae.

Abdomen: pelta as illustrated (fig. 15), its size and general shape fairly constant, but edges variable, sometimes irregularly notched; tergites iii-viii approximately equal in length but their sternites about 17—43 μ longer, iii-vii projecting cephalad, and sternite viii projecting caudad; length tergite/length sternite of segments iii-viii of holotype in μ, respectively: 68/97, 76/114, 80/97, 106/131, 97/119 and 76/119. Tube as illustrated (fig. 16).

Abdominal setae: on tergites iii-vii of macropterous female two pairs of well-developed pointed sigmoid setae, one pair at about middle of disc smaller than the large pair on hind margin, which are about 51—66 μ long; sigmoids absent in brachypterous and apterous females; other tergite setae also large, measured on holotype; S.2 on i-iii expanded, 42—68 μ long, on iv-vii blunt or pointed, 85—91 μ long; S.3 at posterior outer angle on iii and iv expanded, 27—30 μ, on v-vii blunt or pointed, 38—53 μ long; on segments iii and iv these S.3 setae are situated on the tergites, on v between tergite and sternite, or on the latter, on vi and vii they are situated in the postero-lateral angles of the sternites; tergite viii has two pairs near hind angles, blunt or pointed, 44—51 μ in length. On tergite ix and at apex of tube all setae pointed. *On sternites:* rows of accessories about 15 μ long across middle of disc, their numbers: on ii about 5—8, on iii-vii about 13—22, on viii about 4—10 setae; on hind margin only 4 setae on ii-vii, the median pair on ii usually about 21 μ long, the outer pair usually shorter, on iii-vi all four only about 15—17 μ, but on vii both pairs about 40—47 μ; on viii two pairs about 47—51 μ near outer angles, and a much shorter pair between them, all on the disc, not on the posterior flange.

EXPLANATIONS OF LETTERING OF FIGURES 8—13

a	jugulum	K	infraepisternum of prothorax
A	pronotum	L	praeepimeron of mesothorax
B	mesonotum	m	metanotum
C1	coxa of prothorax	M	supraepisternum of mesothorax
C2	coxa of mesothorax	n	mesopraesternum
C3	coxa of metathorax	N	infrapostepimeron of mesothorax
D	pelta (= median sclerite of tergite I)	O	lateral extension of metasternum
e	proepimeron of metathorax	P	sternite I
E	supraepisternum of prothorax	r	infraepisternum of mesothorax
F	proepimeron of prothorax	R	mesosternum
g	lateral sclerites of tergite I	S	metasternum
G	postepimeron of prothorax	T	medioepisternum of mesothorax
H	praescutum	U	praepectus
I	postepimeron plus episternum of metathorax	V	probasisternum
		W	prospinasternum

EXPLANATIONS OF FIGURES.

Apterygothrips carolinae spec. nov.

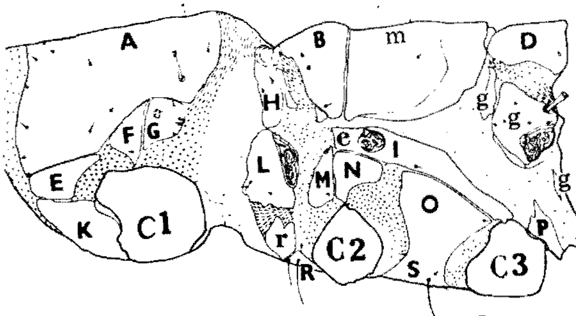
Fig. 8 — ♀, paratype, No. X. 1155-8, lateral aspect of thorax.
9 — ♀, paratype, No. X. 1155-9, ventral aspect of thorax.

Strassenia acarus gen. et spec. nov.

Fig. 10 — ♀, apterous, paratype, No. X. 1243-7, lateral aspect of meso- and metathorax.
11 — ♀, apterous, paratype, No. X. 1243-9, ventral aspect of thorax.
12 — ♂, apterous, paratype, No. X. 1243-12, pseudovirga.

Chiridothrips hartwigi spec. nov.

Fig. 13 — ♂, paratype, No. X. 1295, lateral aspect of mesothorax.
Figs. 8—11, 13 Mrs. M. J. Meyer del.
12 R. zur Strassen del.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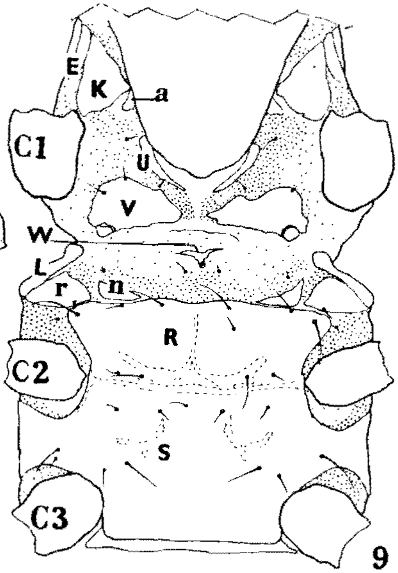
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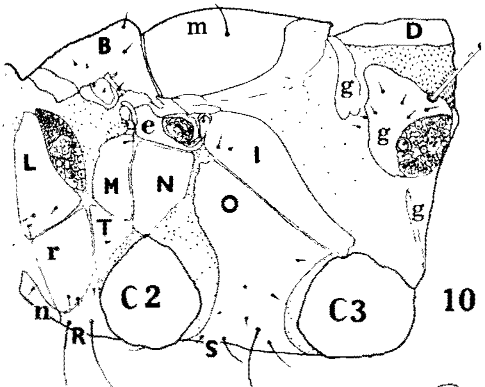
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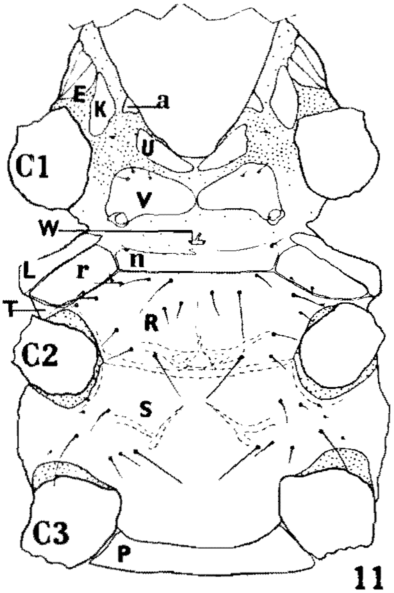
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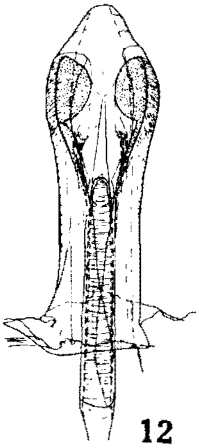

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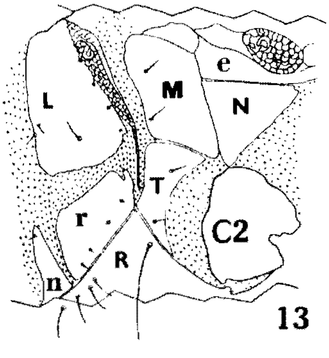
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Dorsal pores on discs: the mesonotum bears two pairs (rarely 5 pores) laterally near anterior margin, the interval of the inner pair about 59—72 μ; on pelta usually 2 pores close to hind margin, sometimes 3, 4 or 5 pores, the interval of inner pair, or the single pair, about 47—80 μ; on tergites ii-vii as a rule two small setae but usually no pores, rarely one pore on ii; on viii two pores about 44—76 μ apart and usually two small setae between them; on ix two pores about 59—76 μ apart with two (rarely three) setae between them; the tube also bears two pores not far from its apex, usually with two setae between them.

Measurements of holotype (macropterous ♀ No. X.1243—1, NaOH-treated, with wings mounted under a separate coverglass) in μ, followed in parentheses by the ranges of this plus two apterous ♀♀ paratypes, one of the smallest (X.1243—6) and one of the largest (X.1243—5 NaOH-treated), on the basis of head length: Length (distended) 1425(1230—1485); *head* L. 148(141—169), W. across eyes 142(—152), least W. at base 119(—130), greatest W. on line of postocular setae 148(—155), W. on basal collar 123(—134); eye, dorsal L. 42(—51), W. 38 and 40(—47), interval 64(55—), ventral L. 38(34—), W. 38(—44), interval 64(—68); *ocelli:* anterior-posterior 17, interval of posterior pair 30, diameters longit./transv. anterior 6/11, posterior 15/13; mouth-cone L. from posterior dorsal margin of head 93(85—); *pronotum* L. 92(—106), W. prothorax including coxae 219(208—233), setae: am. 30(27—34), aa. 38(30—), ml. 30(21—), cx. 21(17—), ep. 55(38—), pm. 36(32—42); mesothorax W. 250(197—), mesonotum L. 52(40—), W. 205(165—), metathorax W. 257(193—); *legs* L./W. ff. 148(120—)/42(—47), ft. 120(106—141)/31(30—34), fta. 49(—64)/21(21), hf. 176(148—190)/38(34—42), ht. 172(169—197)/31(27—), hta. 64(—74)/21(—25); *abdomen* L. 939(831—960), W. 331(317—354), pelta L. 59(42—), W. 109(106—110), tube (segment x only) L. 78(68—), W. base 53(—55), least W. apex 27(25—); setae on tergite ix: S.1: 59(51—64), S.2: 51(—57), S.3: 55(47—); tube setae long 42(—51), short 19(17—).

Antennae: total L. 347(323—369).

Segm.	L.	W.	Segm.	L.	W.
i (whole)	30(—32)	27(—30);	v	53(47—57)	25(—27);
ii	38(—42)	27(—30);	vi	51(47—53)	23(23);
iii	47(38—)	21(19—);	vii	42(—44)	19(—21);
iv	53(47—57)	27(—30);	viii	32(30—)	11(11).

Male (apterous). Length (distended) 1.1—1.2 mm. Somewhat smaller than female, but identical with it in colour and structure, with the following differences: on tergite ix the second of the large setae is only about 27—30 μ long as compared with 51—57 μ in the female; the dorsal pores on thorax and abdomen as in female, but on tergite viii most males have no setae between the pores, while two setae are sometimes present; on tergite ix usually no setae between the pores, rarely one seta present. Sternites iii-vii produced cephalad, longer than their tergites, as in female, but sternite viii not produced caudad, only about 4 μ longer than its tergite.

Pseudovirga as illustrated (fig. 12); the pseudovirgae of thirteen of the males were mounted under separate cover glasses; one of these has been drawn (fig. 12) and the other twelve are very similar to it. Ten of the pseudovirgae lie in a satisfactorily flat position for measuring; the greatest widths of these were found to be 15 μ on one male, 14 μ on seven males, and 12 μ on two males. None of the 19 males before me are oedymerous.

Measurements of *allotype* (apterous ♂ No. X.1243—2, NaOH-treated, one of the largest on basis of head length) in μ, followed in parentheses by those of one of the smallest paratype ♂ ♂ (No. X.1243—10, apterous): Length (distended) 1200(1080); *head* L. 141(127), W. across eyes 140(127), least W. at base 119(109), greatest W. on line of postocular setae 146(134), W. on basal collar 119(116); eye, dorsal L. 42. W. 34 and 38, interval 68, ventral L. 38, W. 34, interval 72; postocular setae 42(34), their interval 116(112), distance from eye 11(9); mouth-cone L. from posterior dorsal margin of head 85(78), maxillary bridge W. 51(55); *pronotum* L. 88(85), W. prothorax including coxae 207(197), setae: am. 25(25), aa. 27(21), ml. 23(15), cx. 15(17), ep. 36(30), pm. 34(32); mesothorax W. 193(169), mesonotum L. 34(38), W. 162(141); metathorax W. 200(176), metanotum L. 78(64); *legs* L./W. ff. 134(113)/42(40), ft. 113(99)/30(30)), fta. 52(51)/21(19), hf. 134 (134)/38(32), ht. 162(134)/25(27) hta. 64(56)/19(19); *abdomen* L. 769 (716), pelta L. 42(34), W. 106(80); tube (segment x only) L. 68(64), W. base 51(47), least W. apex 25(25); setae on tergite ix: S.1: 51(55), S.2: 27(30), S.3: 42(32); tube setae long 40(38), short 17(17).

Antennae: total L. 324(292).

Segm.	L.	W.	Segm.	L.	W.
i (whole)	30(25),	25(25);	v	47(42),	23(23);
ii	38(36),	27(25);	vi	47(42),	21(23);
iii	40(34),	19(19);	vii	38(34),	19(19);
iv	44(42),	25(23);	viii . . .	32(23),	11(9).

Material studied: 2 macropterous ♀ ♀, 4 brachypterous ♀ ♀, 44 apterous ♀ ♀ and 19 apterous ♂ ♂ collected by the writer as follows: TRANSVAAL, on the banks of the Limpopo River, about a mile west of Beit Bridge, 13-v-1958, all the ♀ ♀ and 18 apterous ♂ ♂ (No. X.1243) on a shrub with silvery grey leaves, *Catophractes alexandri* Don.; on the Limpopo at Main Drift about 6 miles north-east of Messina, 14-v-1958, one ♂ (No. X.1305) on a tree, *Croton megalobotrys* Müll. Arg.

The plants were kindly identified by the National Herbarium, Pretoria.

The specific name has been selected to call attention to the mite-like appearance of the living insect, with its abdomen curved up over the thorax and head.

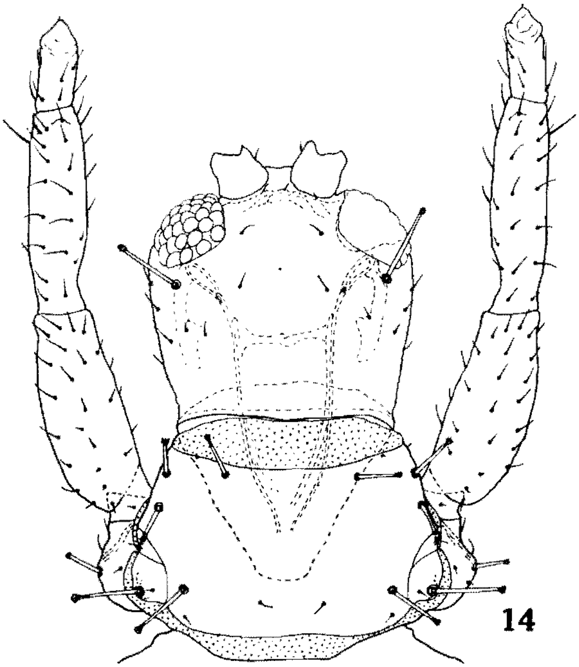
Chiridothrips hartwigi spec. nov. (Figs. 13, 17—23)

Female (macropterous). Length (distended) 2.0—2.1 mm. *Colour:* general colour brown, with antennae and fore tibiae paler; *head* brown, feintly tinged with yellow, with two short irregular transverse brownish yellow bands dorsally at base, one in front of and one behind the occipital apodeme; ventrally, about one-fourth of head length, excluding mouth-cone, is brownish yellow across the whole width, the anterior three-fourths being brown, the pale and dark parts merging imperceptibly; mouth-cone pale brown, with a black spot near tip of labrum, palpi pale brown; *eyes* and ocellar crescents so deep red as to appear black; *antennae:* i brown, about as dark as head, slightly paler dorsally at base, ii about as dark as i in basal half, gradually becoming paler towards apex, which is greyish yellow especially on outer apical angle, iii greyish yellow, iv slightly darker than iii, v and vi still darker, more or less uniformly brownish yellow, vii slightly darker than vi, viii still darker, grey, but paler than i; *pronotum:* disc about like head but slightly more yellowish, epimera and lateral margins darker brown; of the prosternal sclerites the supra- and infra-episternum and the jugulum (E, K and a on fig. 20) as dark as the head, or darker, the praepectals, probasisterna (except on inner caudal margin) and prospinasternum distinctly paler, brownish yellow; *mesonotum* about like disc of pronotum but with narrow black edges anteriorly and latero-caudally; metanotum also yellowish brown, with darker lines across anterior margin and at anterior edges of scutellum, and a darker patch on each side on anterior part of lateral flange; lateral aspects of pterothorax distinctly darker than the nota, dark brown, its sterna about as pale as the nota, with the furcae, the apodeme between meso- and metasternum, and the edges of the coxal cavities dark brown.

Colour of *wings:* fore wings hyaline, except the scale and the patch in front of it bearing the subbasal setae, which are grey, and a small feintly grey spot at narrowest part; hind wings hyaline but briefly pale grey at extreme base and with the median grey spot corresponding to that on fore wing still more feintly indicated. *Legs:* fore femora about as brown as disc of pronotum, but gradually becoming paler towards their apices which are brownish yellow;

EXPLANATIONS OF FIGURES.

Strassenia acarus gen. et spec. nov.
Fig. 14 — ♀, apterous, paratype, No. X. 1243-3, head and prothorax.
15 — ♀, apterous, paratype, No. X. 1243-11, pelta.
16 — ♀, brachypterous, paratype, No. X. 1243-5 tip of abdomen.
Chiridothrips hartwigi spec. nov.
Fig. 17 — ♂, paratype, No. X. 1216-4, head and prothorax.
18 — ♀, holotype, No. X. 1216-1, tip of abdomen.
Figs. 14-17 Mrs. M. J. Meyer del.
18 R. zur Strassen del.



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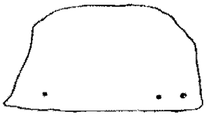

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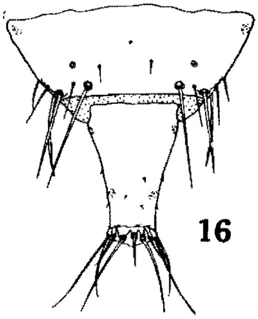

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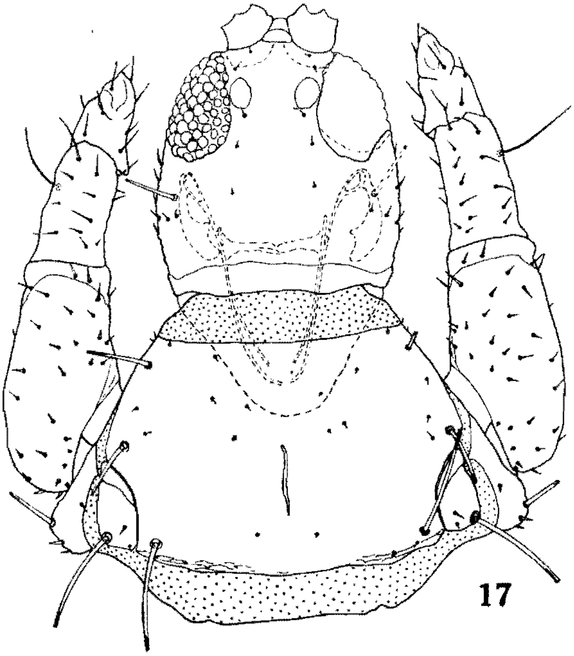

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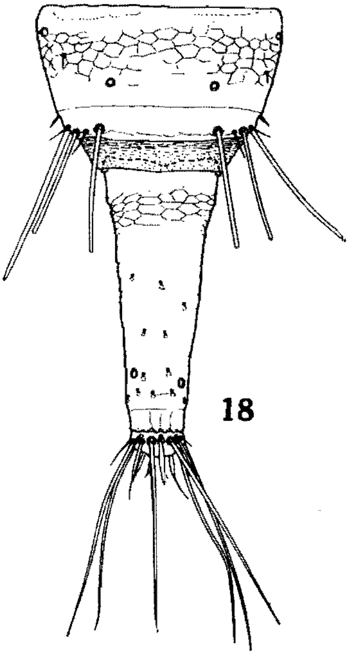

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fore coxae pale brown, fore trochanters greyish yellow, fore tibiae brownish yellow, gradually becoming paler towards their apices which are greyish yellow, fore tarsi greyish yellow with brown cups; middle and hind legs uniformly brown, only the trochanters slightly paler.

Colour of *abdomen:* about as dark above and below as disc of pronotum, but gradually becoming darker from base towards apex, being segments vii, viii and ix being about as dark as sides of pterothorax; the tube is the darkest part of the whole body, being uniformly blackish brown; *major setae* of body and appendages transparent, yellowish, but wing-retaining setae and wing fringes grey to pale brown.

Sculpturing moderately prominent; integument minutely granular; *head* on dorsum smooth between ocelli, between eyes and on a middorsal stripe about equal in width to dorsal eye interval; behind eyes on each side about fifteen irregular, anastomosing, transverse lines, of which about six near postoculars are heavier and darker than the others; occiput behind occipital apodeme with two or three feint lines in region of middorsal line only; outer margins of cheeks irregularly and minutely serrate; laterally the cheek lines extend more or less to line of ventral inner margin of eyes, but they are very feint in anterior half to two-thirds of cheeks, while about six or eight lines in basal third are prominent; median ventral area of head smooth; mouth-cone smooth; *antennae* with a few very feint lines, as illustrated (figs. 21, 22).

Pronotum: disc smooth, although there are some irregular dark lines and blotches just under the surface which suggest surface sculpturing; epimera with three dark apodeme-lines, lateral margins of disc between aa. and ml. setae with four or five prominent longitudinal lines; anterior and posterior margins not thickened, median dorsal apodeme about one-third as long as pronotum, as illustrated (fig. 17); supraepisternum with one or two feint lines, infraepisternum with about six more prominent longitudinal lines; jugulum and prospinasternum more or less smooth; praepectal and probasisternal sclerites each with about six prominent lines; *mesonotum* subreticulate in anterior half, the reticles transversely elongate, posterior half smooth except for the usual two or three transverse lines, on hind margin; of the lateral mesothoracic sclerites the praeepimeron (fig. 13, L) with about 13 prominent irregular vertical lines, the infraepisternum (r) with about 8 less prominent lines, the supraepisternum (M) irregularly reticulate, the medioepisternum (T) with one prominent vertical line, the infrapostepimeron (N) smooth, although it has a dark internal longitudinal line; mesosternum smooth; mesopraesternum with feint transverse lines.

Metanotum with prominent transverse apodeme-lines at anterior margin; the large triangular scutellum subreticulate, the lines somewhat heavier than those of mesonotum, mainly longitudinal, the median part of its caudal one-fourth smooth; rest of disc smooth; latero-posterior flange with fine, irregular, radiating wrinkles; *laterally* the proepimeron (fig. 13, e) of metathorax with fine longitudinal lines, the postepimeron plus episternum more heavily lined in the direction of its long axis; the lateral extension of the metasternum with a prominent longitudinal suture about 35 μ long, about 21 μ from dorsal margin, dorsad of the suture it is heavily reticulate nearly throughout its length, the heaviest lines running longitudinally, but ventrad of suture the antrior half heavily reticulate, posterior half smooth; metasternum smooth.

Wings of both pairs feebly roughened by transverse very thin broken lines and scattered dark dots. *Legs:* fore coxae weakly subreticulate, middle and hind pair with 3—6 transverse anastomosing lines; all femora on dorsal aspect with irregular transverse lines, there being about 10—15 lines on each fore femur, tibiae with weaker lines, tarsi smooth.

Sculpture of abdomen: pelta reticulate in its median third only; disc of tergites ii-ix subreticulate, this sculpturing tending to become more distinct on iv-viii; the reticles most distinct at sides, laterad of wing-retaining setae, where the lines are also minutely and sparsely asperate; between wing-retaining setae the reticles tend to be less distinct, especially on ii and ix, and in caudal one-third or half of this median area they disappear altogether; tube feintly reticulate especially in about basal third; *sternite* i feebly subreticulate; ii-v smooth on median four-fifths of their width, reticulate on about one-tenth of width on each side, i.e. on an area about 35 μ wide, as seen in ventral aspect, but in a laterally-mounted male one sees that the reticulated area is about 106 μ wide and extends to the suture between sternite and tergite; on vi-viii the lateral reticulated areas increase in size caudad, extending respectively over about one-eighth, one-fifth and one-third of width, respectively, on each side, while the laterally-mounted specimen gives measurements of about 81—85 μ for the width of the reticulated area on each side of these three segments; nearly the whole of sternite ix reticulated; on segments vi-viii the ventral sculpturing is about as well developed as that of the tergites.

Head comparatively short, cylindrical, about 1.1 as long as its greatest width, which is across middle of cheeks, 1.0—1.1 as long as pronotum, and 1.0—1.1 as long as the tube. Cheeks and outer margins of eyes forming continuous lines that are gently rounded, converging only very slightly at base. In lateral aspect there is a slight, even bulge dorsally between eyes and base, a slight constriction at base and a moderately sharp point between the antennae where the dorsal and ventral surfaces meet; the dorso-ventral height of the head in the male paratype, mounted laterally, is about 92 μ at eyes and about 120 μ at base. The genal suture extends about 21 μ cephalad from posterior margin of head, but it is merely a "crack", nothing like the wide opening figured by the writer (Faure 1949) for *Streptothrips chaberti* (Faure).

Eyes large, about 0.4 as long as head, not bulging, dorsal and ventral lengths about equal if head is not tilted, closely facetted, the ommatidia circular, contiguous, and of about equal size throughout, except on inner margin near dorsal posterior angle, where some of them are smaller and not contiguous;

about half a dozen small setae on each eye; dorsal and ventral eye widths and intervals also about equal; in lateral aspect the caudal margin of the eye has a widely rounded emargination, whose greatest depth is about 17 μ, measured in the cephalo-caudal direction.

Ocelli situated as illustrated (fig. 17), not on a hump, the anterior ocellus between the first antennal segments, but not actually at tip of interantennal projection if head is not tilted, directed forward, the posterior pair with their hind margin on a transverse line through middle of eyes, directed slightly dorso-laterad. *Head setae:* postoculars about 32—34 μ long, blunt, their interval 130 μ, situated 16—20 μ from eyes; other dorsal head setae as illustrated (fig. 17); ventrally: all head setae short, one pair close to eyes and not far from their middle about 14 μ long, clypeal pair about 28 μ from mouth cone, 21 μ long, their interval 28 μ.

Mouth-cone short, broadly rounded at apex, extending about 122 μ caudad from posterior dorsal margin of head, tip of labrum rounded, not extending beyond apical margin of labium; palpi small and inconspicuous, second segment of maxillary palpus on holotype 21 μ long by 4 μ wide, its apical seta 21 μ, labial palpus only about 3 μ long by 3 μ wide, two labial setae (probably not borne by the palpi) about 34 μ in length; maxillary stylets when fully withdrawn extending to hind margins of eyes, thence widely separated, more or less parallel, sheaths well developed, maxillary bridge as measured between the sheaths 56 μ wide, situated about 21 μ behind a transverse line through postocular setae.

Antennae as illustrated (figs. 21 and 22); segment ii assymetrical, drawn out to a blunt point on outer apical angle; segment viii distinctly narrower at base than at middle; sense-cones short, the longest on iv of holotype 14 u long by 3 μ wide; the formula: iii, 1—1; iv, 2—2; v, 1(+1)—1(+1); vi, 1—1(+1); vii, 1 dorsal; on v the paratype female has 1(+1)—1(+2) on the left antenna, while the allotype male has 1—1(+2) on the right antenna; areola on ii situated near the middle of the total length of the segment, but usually about 4—8 μ nearer the apex than the base.

Pronotum approximately 0.5 as long as width of prothorax including coxae, and about as long as the head; anterior and posterior margins respectively only very slightly concave and convex; major setae: am. absent, all the others present, blunt or slightly expanded at apex., aa., ml. and cx. not very different from one another in length, and usually only about one-third as long as the ep. setae, which do not differ much from the pm. pair. *Prosternal* sclerites as illustrated (fig. 20); praepectal plates (U) well developed, large, variable in outline, and on holotype female the right plate is divided into a large anterior and a smaller postero-lateral sclerite; prospinasternum (W) rather large, subtriagular; just mesad of the infraepisternum (K) there is on each side a prominent cone-shaped sclerite (a) for which the term *jugulum* is hereby proposed. This sclerite is also present, but much smaller, in

Apterygothrips carolinae spec. nov. and in *Strassenia acarus* gen. et spec. nov. described above (figs. 9 and 11,a).

Mesonotum of holotype 76 μ long and 233 μ wide; a pair of blunt moderately thick setae 21 μ long sligthly mesad and caudad of lateral extremities, and another thinner pair 21 μ long near middle of hind margin; lateral mesothoracic sclerites as illustrated (fig. 13), praeepimeron (L) and infraepisternum (r) separated by a strip of stipple membrane that is about 4 μ high at caudal end and 16 μ high at cephalic end, as measured in the dorso-ventral direction; middle coxal cavity "closed" in front by a well developed medioepisternum (T), which is separated from the mesosternum by a distinct suture; mesothoracic spiracle as high (dorso-ventrally) as the praeepimeron and apparently produced ventrad to near the angle of the mesosternum by a row of differentiated tubercles in the stipple membrane.

Mesosternum, measured on holotype, median length 92 μ, width between coxae 254 μ, pair of setae near antero-lateral angles about 59 μ long, three other pairs on anterior margin shorter, one pair on hind margin 71 μ long, each seta 64 μ from coxa; mesopraesternum variable, on holotype deeply and irregularly emarginate in front, its width 162 μ, length at side 49, length in middle 7 μ; on paratype female the median part reduced to a much shorter strip detached by a short break from left triangular part; on allotype male the mesopraesternum is similar to that of holotype, but on the paratype male it is also degenerate, the two triagular parts not connected by a median bridge.

Metanotum, measured on holotype, length including flange 212 μ, width at middle including flanges 261 μ; one pair of disc setae about 17 μ long, their interval 68 μ, distance from anterior margin 68 μ, and two similar setae on each side, on anterior margin at edges of scutellum. Laterally, the lateral extension of mesosternum divided into two parts by an incomplete suture described above under "sculpturing"; it is separated from the infrapostepimeron of the mesothorax (fig. 13, N) by a strip of stipple membrane about 17 μ long at its shortest point, as measured in the cephalo-caudal direction. Metasternum bears four thin pointed setae 78—85 μ long in a transverse row near hind coxae, interval of median pair on holotype 134 μ.

Wings fully developed on all five specimens, slightly narrowed and humped at the middle (fig. 19), their fringe hairs smooth, duplicated cilia absent; subbasal setae blunt or slightly expanded at apex, the second one situated about 6 μ caudad of a line joining the first and third setae.

Legs: short, fore legs of female very similar to those of male (fig. 17), but fore tarsi with a much smaller rounded hump-like tooth; on middle and hind tibiae the longest spur-like blunt seta is situated on the outer side at apex, its length on middle tibia of holotype 38 μ, on hind tibia 51 μ; no teeth or spurs on femora.

Abdomen: pelta (fig. 23) large, subtriangular, variable in outline; *sternite viii produced caudad, distinctly longer than its tergite;* L. tergite/L. sternite on segments ii-viii of holotype respectively in μ: 85/85, 78/85, 85/92, 92/106, 99/106, 99/106, 99/141; tube as illustrated (fig. 18), its sides parallel in about basal one-seventh, thence practically straight, converging to apex where sides are slightly constricted.

Setae on abdomen: two pairs of wing-retaining setae on tergites ii-vii, the anterior, smaller pair near middle of dics, the posterior pair on hind margin, both pairs directed mesad, pointed, but not markedly sigmoid in shape; especially on the holotype, only two or three of these setae have the sigmoid shape, but on the paratype female the posterior pair on tergites iii-v are sigmoids; length of the posterior pair measured on holotype: on tergite ii: 53 μ, on iii-vii: 63—81 μ. The seta S.2, situated about half-way between posterior sigmoid and postero-lateral angle, large, conspicuous, blunt, its length on ii-vii of holotype 77—89 μ; on specimens mounted with the dorsal surface uppermost, in the usual way, the setae S.3 appear to be borne in the postero-lateral angles of the tergites iii-vii; but on the male paratype mounted laterally one sees that these S.3 setae are actually situated in the postero-lateral angles of the sternites; measured on holotype, the blunt S.3 setae of iii-vii are respectively 49, 57, 65, 81 and 114 μ in length. Tergite viii bears two thick blunt setae at each hind angle, the inner pair 42, the outer 93—99 μ long, the latter about 4 μ wide at base.

Sternite setae: sternites ii-viii bear a transverse row of accessories on disc, about 10—15 μ long, there being about 15 of these setae on sternites iv-vi; on hind margin, as seen in dorso-ventral aspect, only 4 setae apart from the S.3 discussed in the preceding paragraph; ii-vii each bear a large median pair of pointed setae about 55—77 μ long, and one outer pair shorter than the accessories.

Dorsal pores: mesonotum has two (or three) pores on each anterior angle, the interval of inner pair 120 μ, no setae associated with them; pelta

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EXPLANATIONS OF FIGURES.

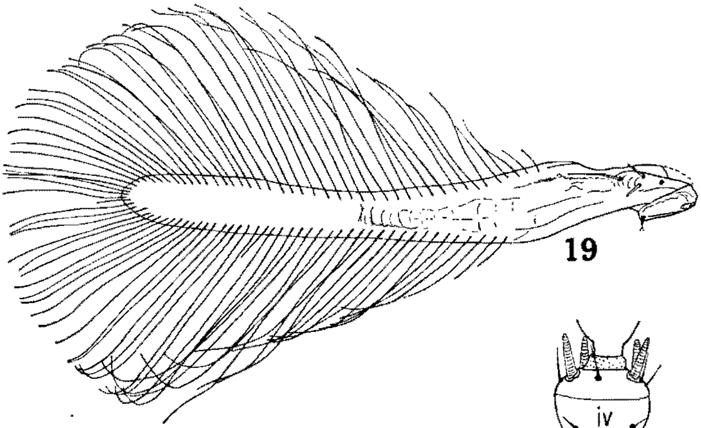
Chiridothrips hartwigi spec. nov.

Fig. 19 — ♀, holotype, No. X. 1216-1, left fore wing.
20 — ♂, paratype, No. X. 1216-4, prosternum, lettering the same as that used on figures 8—13.
21 — ♀, paratype, No. X. 1216-3, segments i-iv of right antenna.
22 — ♂, allotype, No. X. 1216-2, right antenna.
Figures 21 and 22 drawn to same scale of enlargement
23 — ♀, holotype, No. X. 1216-1, pelta.

Strassenia acarus gen. et spec. nov.

Fig. 24 — ♀, apterous, paratype, No. X. 1243-12, tergite iv of abdomen, to show the sculpturing, the fine striae are present in all the reticles, but not in the two subcircular muscle attachments; striae shown enlarged below.

Figs. 19—23 Mrs. M. J. Meyer del.
24 R. zur Strassen del.



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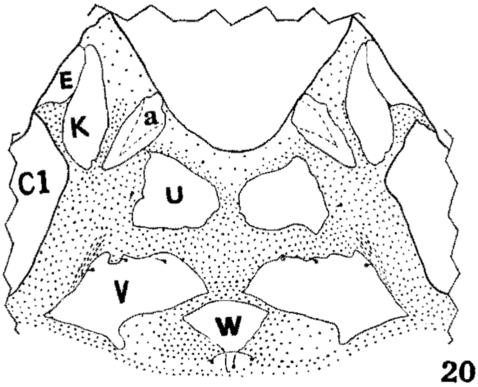

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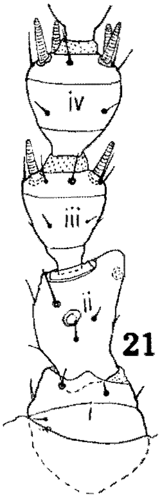

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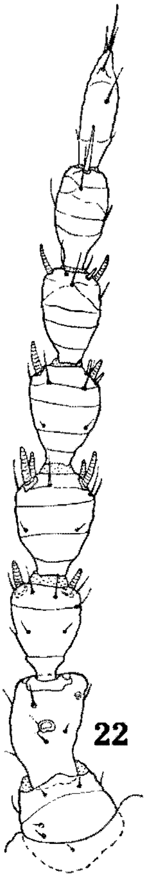

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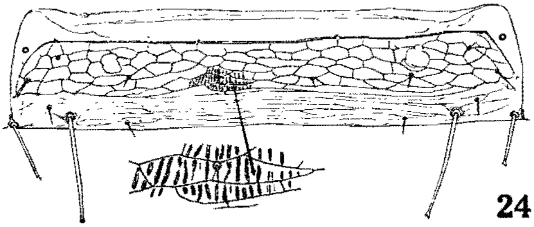

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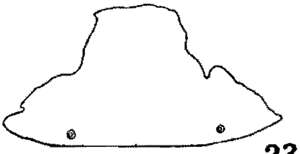

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has two pores on hind margin 85—88 μ apart, no setae; tergites ii-vii each with two pores 21—45 μ apart, and one seta laterad of each pore; viii also with two pores, 56 μ apart, with four setae behind them, ix has two pores without setae associated with them.

Measurements of *holotype* (macropterous ♀ No. X.1216-1, NaOH-treated, with wings mounted separately) in μ, followed in parentheses by those of the paratype female (No. X.1216-3): Length (distended) 2031(2080); *head* L. 178(176), W. across eyes 150(152), least W. near base 162(163), greatest W. across middle of cheeks 170(167), W. on basal collar 163(161); *eye* dorsal L. 65 W. 45, interval 57, ventral L. 77, W. 49, interval 53; ocelli: anterior-posterior 32, interval of posterior pair 32, diameters longit./transv. anterior 8/14, posterior 18/18; *pronotum* L. 170(172), W. prothorax including coxae 355(353), setae (all blunt): aa. 23(30), ml. 24(25), cx. 37(36), ep. 85 and 89(93), pm. 81(72); mesothorax W. 353(353); *fore wing* L. 785(816), W. across scale 75(69), W. at widest point near first cilia 97(105), W. at middle 65(69), W. 100 μ from apex 77 (81), fringe anterior L. 324(324), posterior L. 365(324), subbasal setae a. 24(24), b. 24(32), c. 71(65), intervals a-b. 8(8), b-c. 20(24); *legs* L./W. ff. 170(184)/75(85), ft. 77(93)/51(57), fta. 57(65)/37(43), hf. 166(174)/53(57), ht. 178(187)/41(43), hta. 73(81)/32(34); *abdomen* L. 1247(1293), W. 397(401), pelta L. 85(92), W. at base 169(190), tube (segment x only) L. 162(172), W. at base 67(72), least W. at apex 32(31); setae on tergite ix: S.1: 77(89) blunt, S.2: 69(93) blunt, S.3: 89 and 101(116) pointed; tube setae: long 126(136) pointed.

Antennae: total L.

Segm.	L.	W.	Segm.	L.	W.
i (whole) .	37(30),	39(40);	v	37(38),	30(30).
ii	45(42),	32(34);	vi	34(36),	24(25).
iii	41(36),	30(30);	vii	41(38),	20(19).
iv	37(38),	34(34);	viii	49(47),	12(13).

Male (macropterous). Length (distended) 1.6—1.7 mm. Smaller than female but very similar to it in colour and structure, with the following differences: fore legs darker, the femora only very slightly paler at extreme apex, the tibiae yellowish brown, paler at apex. In the ratios of measurements the male differs in having the head 1.2—1.3 as long as pronotum and 1.3 as long as tube; the pronotum and the tube are both 0.8 as long as the head. In the male antennal segment ii is only slightly produced on the outer apical angle (compare figs. 21 and 22). The fore tarsus of the male bears a relatively blunt, backward-directed tooth at base (fig. 17). On tergite ix the setae S.2 are pointed and only 20—25 μ long. Sternite viii is not noticeably longer than its tergite.

Measurements of *allotype* (macropterous ♂ No. X.1216-2) in μ, followed in parentheses by those of one paratype ♂, NaOH-treated No. X.1216-4:

Length (distended) 1585(1680); *head* L. 182(176), W. across eyes 140(141), greatest W. across middle of cheeks 154(155), W. on basal collar 140(137); *eye* dorsal L. ?(69), W. ?(45), interval ?(53), ventral L. ?(65), W. ?(49), interval ?(49); ocelli: anterior-posterior 28(34), interval of posterior pair 28(27), diameters longit./transv. anterior 10(8)/16(16), posterior 18(18) /16(16); postocular setae 23(34) blunt, interval 124(123), distance from eye ?(20); mouth-cone L. from posterior dorsal margin of head 69(85); *pronotum* L. 136(144), W. prothorax including coxae 292(299) setae (all blunt) aa. 20(38), ml. 24(34), cx. 32(30), ep. 61 and 65(61), pm. 73(64); fore wing L. 662(685), W. across scale 57(68), W. at widest point near first cilia 87(89), W. at middle 53(55), W. 100 μ from apex 69(72), fringe anterior L. 264(268), posterior 284(289), subbasal setae (all blunt) a. 27, b. 25, c. 68, intervals a-b. 9 and 4(8), b-c. 13 and 21(16); *legs* L./W. ff. 144(150)/69(68), ft. 85(81)/41(40), fta. 55(53)/32(32), its tooth 8(8)/8(8), hf. 130(138)/41(45), ht. 146(154)/32(37), hta. 73(69)/24(30); *abdomen* L. 923(954), W. 292(288), pelta L. 71(71), W. 141(120), tube (segment x only) L. 138(137), W. at base 61(56), least W. at apex 28(28); setae on tergite ix: S.1 blunt 73(72), S.2. pointed 20(25), S.3. pointed 118(108); tube setae, long, pointed 101(101).

Antennae: total L. 296(306)

Segm.	L.	W.	Segm.	L.	W.
i (whole)	28(30),	32(34);	v	37(38),	25(25).
ii	41(38),	28(32);	vi	35(36),	22(21).
iii	37(36),	26(27);	vii	37(38),	18(17).
iv	37(34),	28(30);	viii	45(44),	12(13).

Material studied: 2 ♀♀ and 3 ♂♂ mounted on slides in Canada balsam, collected by the writer: SOUTHERN RHODESIA: Birchenough Bridge on the Sabi River, 2-v-1958, 2 ♀♀ and 2 ♂♂ (No. X.1216) on *Centemopsis biflora* (Schinz.) Schinz., an indigenous shrub belonging to the family Amarantaceae; Lundi River, 12-v-1958, 1 ♂ (No. X.1295) collected while beating dead branches of indigenous trees.

From the only other species in this genus, *C. indicus* Ram. and Marg. 1939, the new species differs inter alia in having (1) four sense-cones on segment iv of the antenna, instead of only two, (2) one or two rudimentary sense-cones on segment v in addition to one large inner and one large outer cone, (3) :1—1(+1) cones on vi instead of 0—1, and (4) no antero-marginal setae on the pronotum.

I am greatly indebted to Professor T. N. Ananthakrishnan of Madras, India, for unpublished notes on *C. indicus*.

This new species is named after my colleague Dr. E. K. Hartwig in recognition of his important contributions to the taxonomy of the Thysanoptera, and especially in appreciation of his discovery of the new technique of collecting material into 10 % alcohol. This technique has resulted in a great improvement in the general quality of our slide mounts.

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